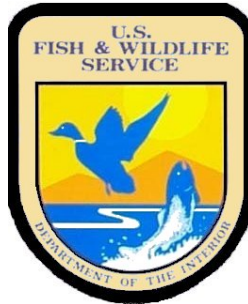


The Road Inventory of Sutter River National Wildlife Refuge Yuba City, CA



Prepared By:
Federal Highway Administration
Central Federal Lands Highway Division
May 2012



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INTRODUCTION

The Transportation Equity Act for the 21st Century (Public Law 105-178) created the Refuge Roads Program. Refuge roads are those public roads that provide access to or within a unit of the National Wildlife Refuge System and for which title and maintenance responsibility is vested in the United States Government. Funds from the Highway Trust Fund are available for refuge roads and can be used by the station to pay the cost of:

- (a) Maintenance and improvements of refuge roads.
- (b) Maintenance and improvements of:
 - (1) Adjacent vehicle parking areas
 - (2) Provision for pedestrians and bicycles and
 - (3) Construction and reconstruction of roadside rest areas that are located in or adjacent to wildlife refuges
- (c) Administrative costs associated with such maintenance and improvements.

The funds available for refuge roads are to be disbursed based on the relative needs of the various refuges in the National Wildlife Refuge System, and taking into consideration:

- (a) The comprehensive conservation plan for each refuge;
- (b) The need for access as identified through land use planning; and
- (c) The impact of land use planning on existing transportation facilities.

To determine the relative needs of the U.S. Fish and Wildlife Service, the Federal Highway Administration (FHWA) was asked to inventory all public access roads and parking lots and provide a condition assessment of each. In 2008 the inventory was expanded to include administrative (service use only) roads and parking lots. An FHWA representative meets with refuge personnel to identify route segments and assign route numbers and functional classifications (See Appendix) for each route. All roads and parking lots are mapped using Trimble GPS units and visually assessed for condition using the RSL method of evaluation developed at Utah State University (See Appendix). Culverts, Gates, Guardrails and Low Water Crossings are also mapped and inspected for any obvious defects.

An estimate is provided, in year 2008 dollars, based on the condition determined by the rating system. Estimates are based upon data and location factors from the 2008 RS Means Heavy Construction Cost Data 22nd Annual Edition. Cost estimates should be evaluated on a case-by-case basis when being used for programming purposes.

Native Surfaced roads and parking lots already inventoried will not be re-inventoried and will not appear individually in report chapters 5, 6 and 8. Mileages and areas of native surfaced roads and parking lots will still appear in all summaries in the report and will remain in the road inventory database. In addition to this report, the FHWA will furnish the condition ratings of each route and segment to the Fish and Wildlife Service in a Microsoft Access database so the data can be included in their Real Property Inventory.

Sutter National Wildlife Refuge - 81623

Summaries

Route Miles and Percentages by Functional Class and Condition

Condition Rating (Based on RSL)*

F. C.	Excellent		Good		Fair		Poor		Failed		TOTAL MILES
	MILES	%	MILES	%	MILES	%	MILES	%	MILES	%	
I	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00
II	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00
III	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00
IV	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00
V	0.22	1.1%	16.64	86.3%	2.43	12.6%	0.00	0.0%	0.00	0.0%	19.29
Totals	0.22	1.1%	16.64	86.3%	2.43	12.6%	0.00	0.0%	0.00	0.0%	19.29

*For a description of condition ratings for the various surface types see the Appendix.

Route Miles and Percentages by Surface Type and Condition

Paved Condition Rating [Condition(RSL)]

Surface	Excellent		Good		Fair		Poor		Failed		TOTAL MILES
	MILES	%	MILES	%	MILES	%	MILES	%	MILES	%	
AS	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00
CO	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00
Totals	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00

Unpaved Condition Rating [Condition(RSL)]

Surface	Excellent		Good		Fair		Poor		Failed		TOTAL MILES
	MILES	%	MILES	%	MILES	%	MILES	%	MILES	%	
GR	0.22	4.1%	5.20	95.9%	0.00	0.0%	0.00	0.0%	0.00	0.0%	5.42
NA	0.00	0.0%	11.44	82.5%	2.43	17.5%	0.00	0.0%	0.00	0.0%	13.87
PR	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00
Totals	0.22	1.1%	16.64	86.3%	2.43	12.6%	0.00	0.0%	0.00	0.0%	19.29

Square Footage (Parking Areas)

Condition Rating

Surface	Excellent		Good		Fair		Poor		Failed		Total SQ FT
	SQ FT	%	SQ FT	%	SQ FT	%	SQ FT	%	SQ FT	%	
AS	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0
CO	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0
GR	0	0.0%	146,373	100.0%	0	0.0%	0	0.0%	0	0.0%	146,373
NA	0	0.0%	0	0.0%	4,593	100.0%	0	0.0%	0	0.0%	4,593
PR	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0
Totals	0	0.0%	146,373	97.0%	4,593	3.0%	0	0.0%	0	0.0%	150,966

Sutter National Wildlife Refuge - 81623

Summaries

Route Miles and Percentages by Use Type and Condition

Road Condition Rating: Public/Administrative Use

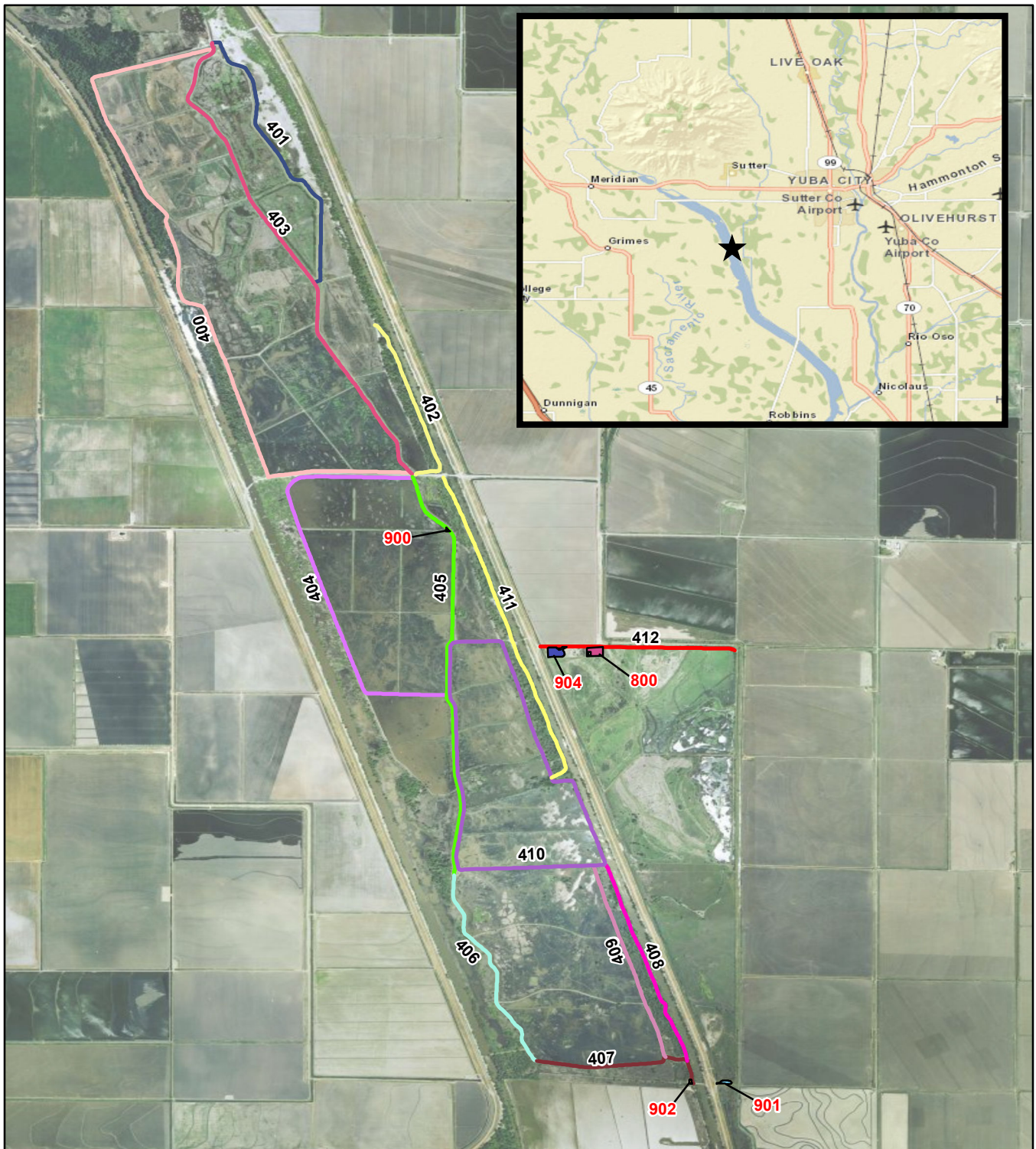
USE TYPE	Excellent		Good		Fair		Poor		Failed		TOTAL MILES
	MILES	%	MILES	%	MILES	%	MILES	%	MILES	%	
Public (FC I-III)	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00
Admin (FC IV-V)	0.22	1.1%	16.64	86.3%	2.43	12.6%	0.00	0.0%	0.00	0.0%	19.29
Totals	0.22	1.1%	16.64	86.3%	2.43	12.6%	0.00	0.0%	0.00	0.0%	19.29

Parking Condition Rating: Public/Administrative Use

USE TYPE	Excellent		Good		Fair		Poor		Failed		Total Sq Ft
	Sq Ft	%	Sq Ft	%	Sq Ft	%	Sq Ft	%	Sq Ft	%	
Public	0	0.0%	86,303	94.9%	4,593	5.1%	0	0.0%	0	0.0%	90,896
Admin	0	0.0%	60,070	100.0%	0	0.0%	0	0.0%	0	0.0%	60,070
Totals	0	0.0%	146,373	97.0%	4,593	3.0%	0	0.0%	0	0.0%	150,966

Sutter National Wildlife Refuge

ROUTE LOCATION MAP



Sutter National Wildlife Refuge - 81623

Route Identification List

Shading Color Key:

White = Paved Routes
Yellow = Unpaved Routes

RTE #	Asset Number	ROUTE NAME	RTE MI	ROUTE DESCRIPTION	PAVED MI	UN-PAVED MI	LANES	FC
400	10000525	Tract 2/4/8 West Boundary Road	2.93	From Main Canal Road (Route 403) to Main Canal Road (Route 403)	-	2.93	1	5
401	10000525	Highline West Service Road	1.27	From Main Canal Road (Route 403) to Main Canal Road (Route 403)	-	1.27	1	5
402	10000523	North Tree Road	0.80	From Hughes Road to end of route at levee	-	0.80	1	5
403	10000561	Main Canal Road	2.20	From Highline Service Road (Route 401) to Hughes Road	-	2.20	1	5
404	10000525	Tract 9 Service Road	1.73	From South Main Canal West Bank Road (Route 405) to South Main Canal West Bank Road (Route 405)	-	1.73	1	5
405	10000561	South Main Canal West Bank Road	1.87	From Hughes Road to Tract 15/16/17 West Access Road (Route 406)	-	1.87	1	5
406	10000525	Tract 15/16/17 West Access Road	0.94	From South Main Canal West Bank Road (Route 405) to Tract 17 South Boundary Road (Route 407)	-	0.94	1	5
407	10000561	Tract 17 South Boundary Road	0.66	From Tract 15/16/17 West Access Road (Route 406) to South Disabled Hunter Parking (Route 902)	-	0.66	1	5
408	10000523	South Tree Road	0.95	From Tract 17 South Boundary Road (Route 407) to Tract 12/14 Perimeter Access Road (Route 410)	-	0.95	1	5
409	10000525	Tract 15/16/17 East Access Road	0.91	From Tract 17 South Boundary Road (Route 407) to Tract 12/14 Perimeter Access Road (Route 410)	-	0.91	1	5
410	10000525	Tract 12/14 Perimeter Access Road	2.87	From Tract 15/16/17 East Access Road (Route 409) to end of loop at Tract 15/16/17 East Access Road (Route 409)	-	2.87	1	5
411	10000523	Middle Tree Road	1.47	From Tract 12/14 Perimeter Access Road (Route 410) to Hughes Road	-	1.47	1	5
412	10000561	North Boundary of 440 Road	0.69	From Corp of Engineers levee to refuge boundary	-	0.69	2	5

Sutter National Wildlife Refuge - 81623

Route Identification List (Parking)

Shading Color Key:

White = Paved Routes
Green = Unpaved Routes

Route #	Asset Number	ROUTE NAME	Area (Sq Ft)	ROUTE DESCRIPTION	Surface Type
800	10000527	Maintenance Yard Parking	60,070	From North Boundary of 440 Road (Route 412) at Schlag Road intersection	Gravel
900	10059351	North Disabled Hunter Parking	3,530	From South Main Canal West Bank Road (Route 405)	Gravel
901	10000563	Lot B Parking	14,836	From east side of the Butte Slough 500 ft east of South Tree Road (Route 408)	Gravel
902	-	South Disabled Hunter Parking	4,593	From Tract 17 South Boundary Road (Route 407)	Native
904	10000562	Check Station Parking	67,937	From North Boundary of 440 Road (Route 412)	Gravel

CHANGES TO THE FISH AND WILDLIFE SERVICE ROAD INVENTORY REPORT

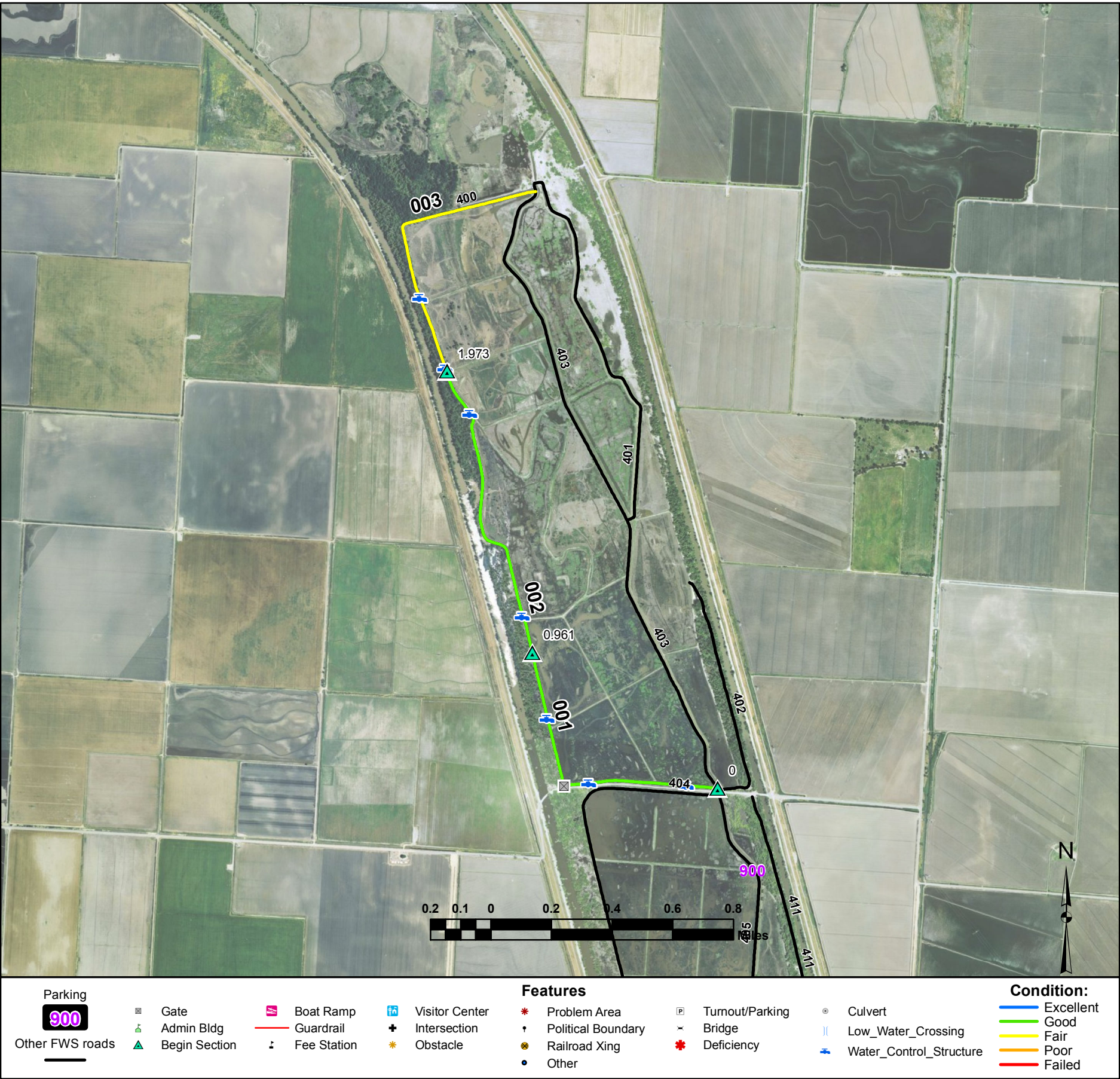
Sutter National Wildlife Refuge - 81623

Routes added to previous inventory:		
Rte #	Route Name	Reason For Addition
400	Tract 2/4/8 West Boundary Road	New Administrative Route
401	Highline West Service Road	New Administrative Route
402	North Tree Road	New Administrative Route
403	Main Canal Road	New Administrative Route
404	Tract 9 Service Road	New Administrative Route
405	South Main Canal West Bank Road	New Administrative Route
406	Tract 15/16/17 West Access Road	New Administrative Route
407	Tract 17 South Boundary Road	New Administrative Route
408	South Tree Road	New Administrative Route
409	Tract 15/16/17 East Access Road	New Administrative Route
410	Tract 12/14 Perimeter Access Road	New Administrative Route
411	Middle Tree Road	New Administrative Route
412	North Boundary of 440 Road	New Administrative Route
800	Maintenance Yard Parking	New Administrative Route
900	North Disabled Hunter Parking	New Public Route
901	Lot B Parking	New Public Route
902	South Disabled Hunter Parking	New Public Route
904	Check Station Parking	New Public Route

Routes removed from previous inventory:		
Rte #	Route Name	Reason For Removal

Routes modified from previous inventory:			
Rte #	Route Name	Type of Modification	Description of Modification

Comments:



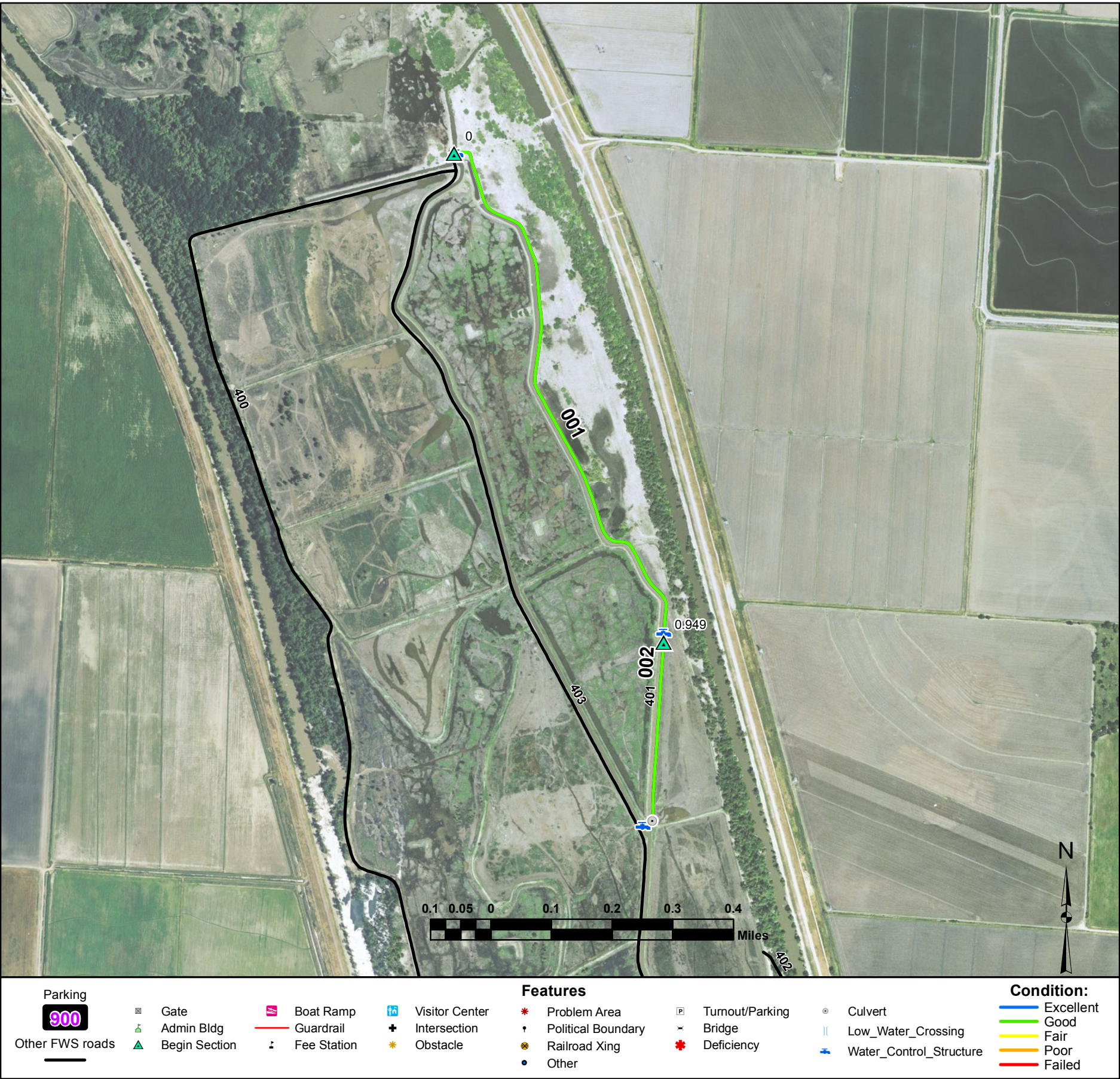
Tract 2/4/8 West Boundary Road
From Main Canal Road (Route 403) to Main Canal Road (Route 403)

Route Number: 400

Total Route Mileage: 2.93

Asset Number	10000525	10000525	10000525		
Section Number	001	002	003		
Section Length (miles)	0.96	1.01	0.96		
Inspection Date	02-25-2012	02-25-2012	02-25-2012		
Surface Type	Native	Native	Native		
Number of Lanes	1	1	1		
Roadway Width (feet)	14	14	14		
Condition	Good	Good	Fair		
Remaining Service Life (years)	7	7	4		
Estimated Cost to Repair	\$2,000	\$2,100	\$2,500		
Current Replacement Value	\$415,300	\$436,900	\$415,300		

Features	Mile Post	Features	Mile Post	Features	Mile Post	Features	Mile Post
Begin Section	001-0.0						
Water Control Structure	001-0.11						
Water Control Structure	001-0.47						
Gate	001-0.56						
Water Control Structure	001-0.76						
Begin Section	002-0.96						
Water Control Structure	002-1.08						
Water Control Structure	002-1.81						
Begin Section	003-1.97						
Water Control Structure	003-1.98						
Water Control Structure	003-2.21						



Highline West Service Road

From Main Canal Road (Route 403) to Main Canal Road (Route 403)

Route Number: 401

Total Route Mileage: 1.27

Asset Number	10000525	10000525			
Section Number	001	002			
Section Length (miles)	0.95	0.32			
Inspection Date	02-25-2012	02-25-2012			
Surface Type	Native	Native			
Number of Lanes	1	1			
Roadway Width (feet)	14	14			
Condition	Good	Good			
Remaining Service Life (years)	5	5			
Estimated Cost to Repair	\$2,000	\$700			
Current Replacement Value	\$411,000	\$138,400			

Features	Mile Post	Features	Mile Post	Features	Mile Post	Features	Mile Post
Begin Section	001-0.0						
Water Control Structure	001-0.01						
Water Control Structure	001-0.93						
Begin Section	002-0.95						
Culvert	002-1.24						
Water Control Structure	002-1.26						



ROUTE 403

900

Parking

Other FWS roads

Gate

Admin Bldg

Begin Section

Boat Ramp

Guardrail

Fee Station

Visitor Center

Intersection

Obstacle

Problem Area

Political Boundary

Railroad Xing

Other

Turnout/Parking

Bridge

Deficiency

Culvert

Low_Water_Crossing

Water_Control_Structure

Excellent

Good

Fair

Poor

Failed

Main Canal Road

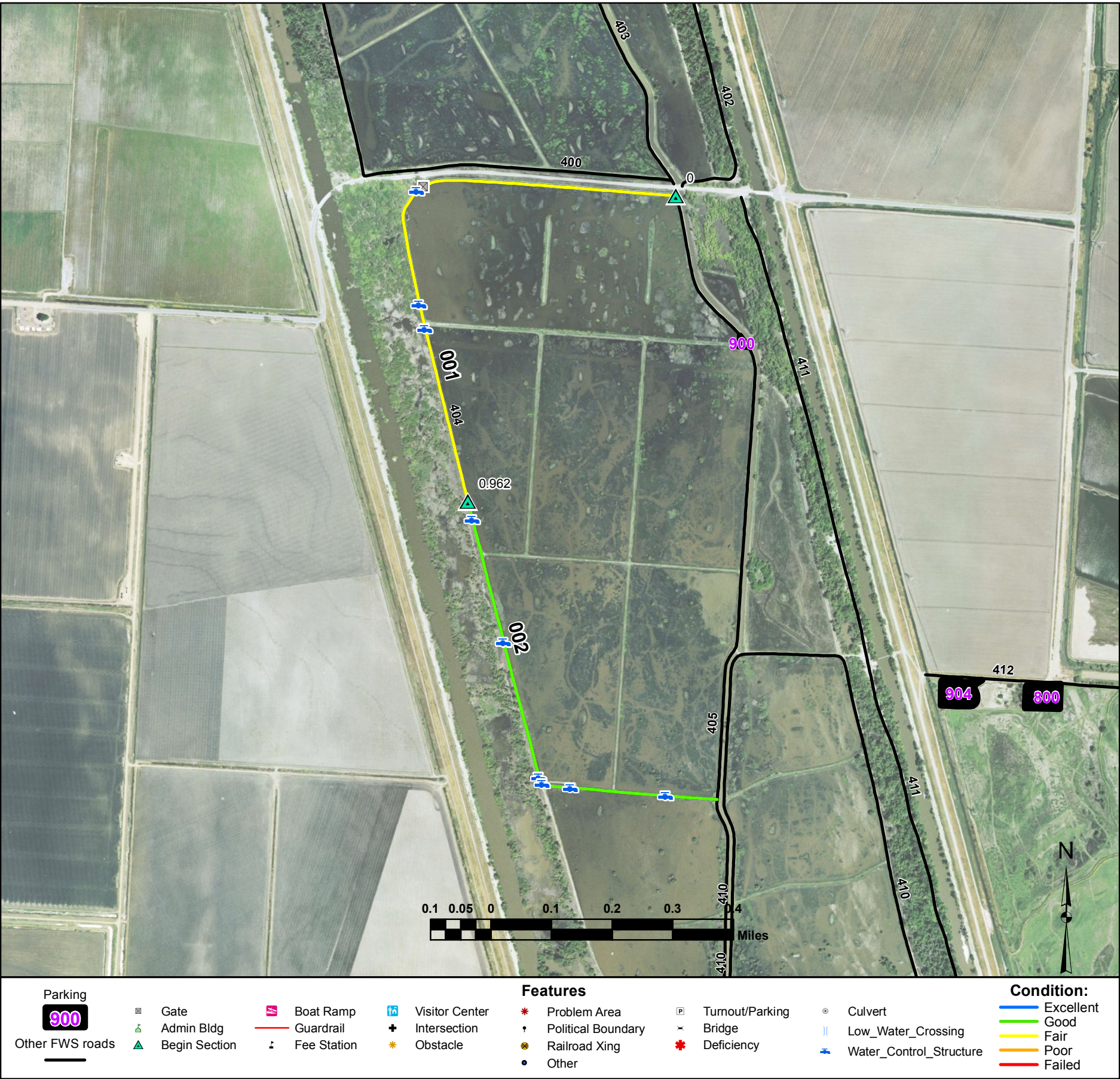
From Highline West Service Road (Route 401) to Hughes Road

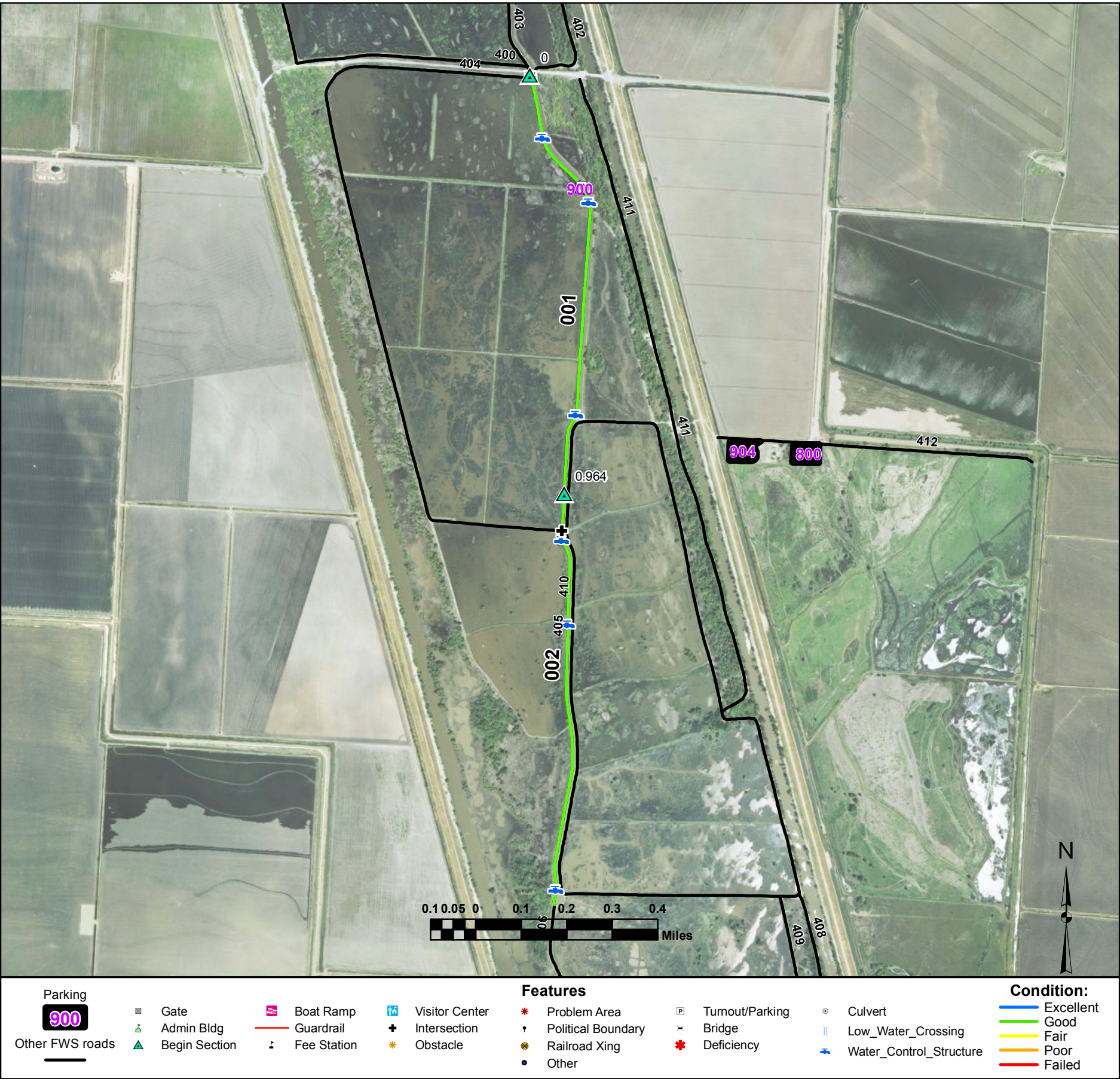
Route Number: 403

Total Route Mileage: 2.21

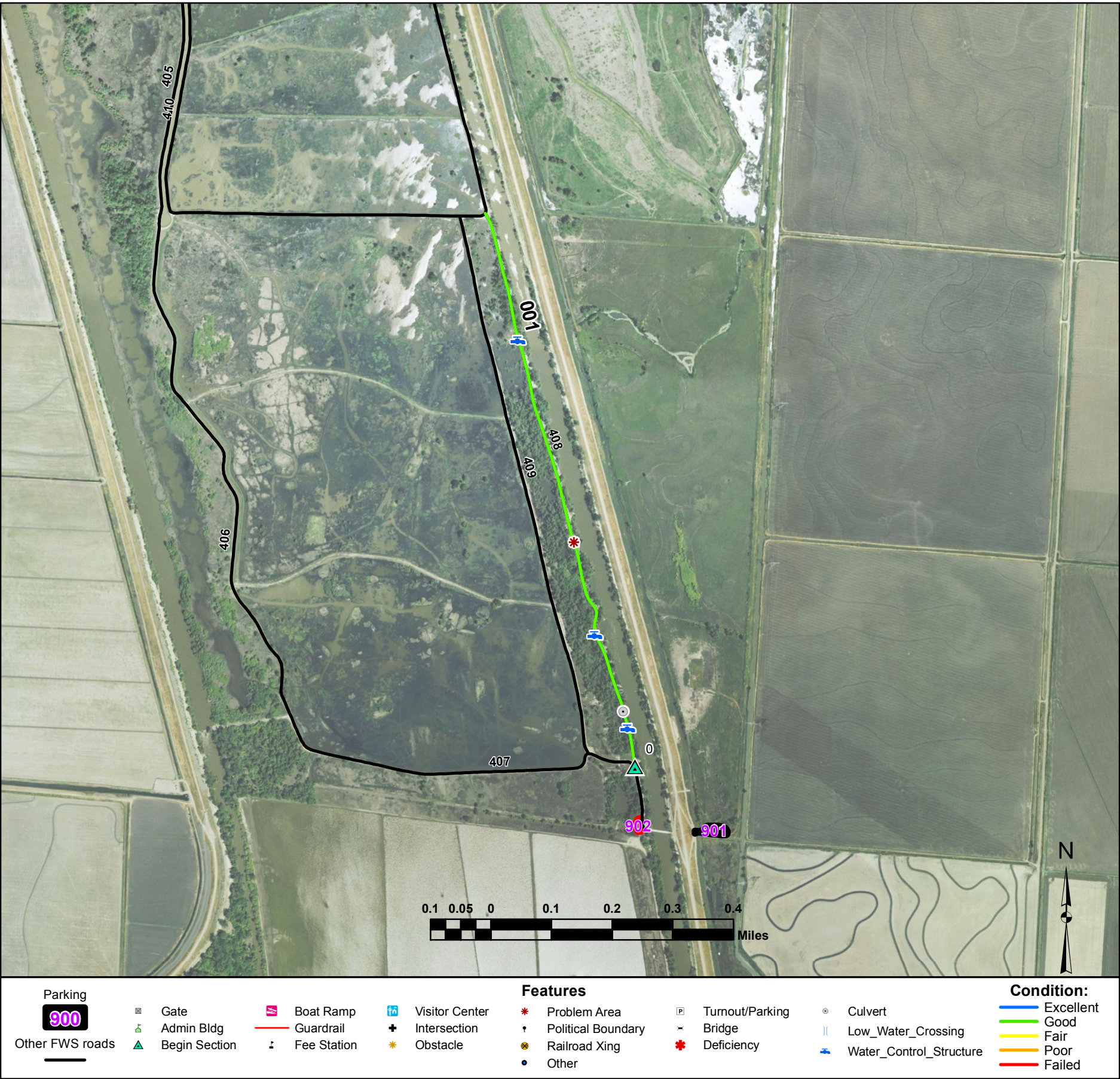
Asset Number	10000561	10000561	10000561		
Section Number	001	002	003		
Section Length (miles)	0.96	0.99	0.25		
Inspection Date	02-25-2012	02-25-2012	02-25-2012		
Surface Type	Gravel	Gravel	Gravel		
Number of Lanes	1	1	1		
Roadway Width (feet)	12	12	12		
Condition	Good	Good	Good		
Remaining Service Life (years)	7	7	5		
Estimated Cost to Repair	\$1,900	\$1,900	\$500		
Current Replacement Value	\$802,800	\$827,900	\$209,100		

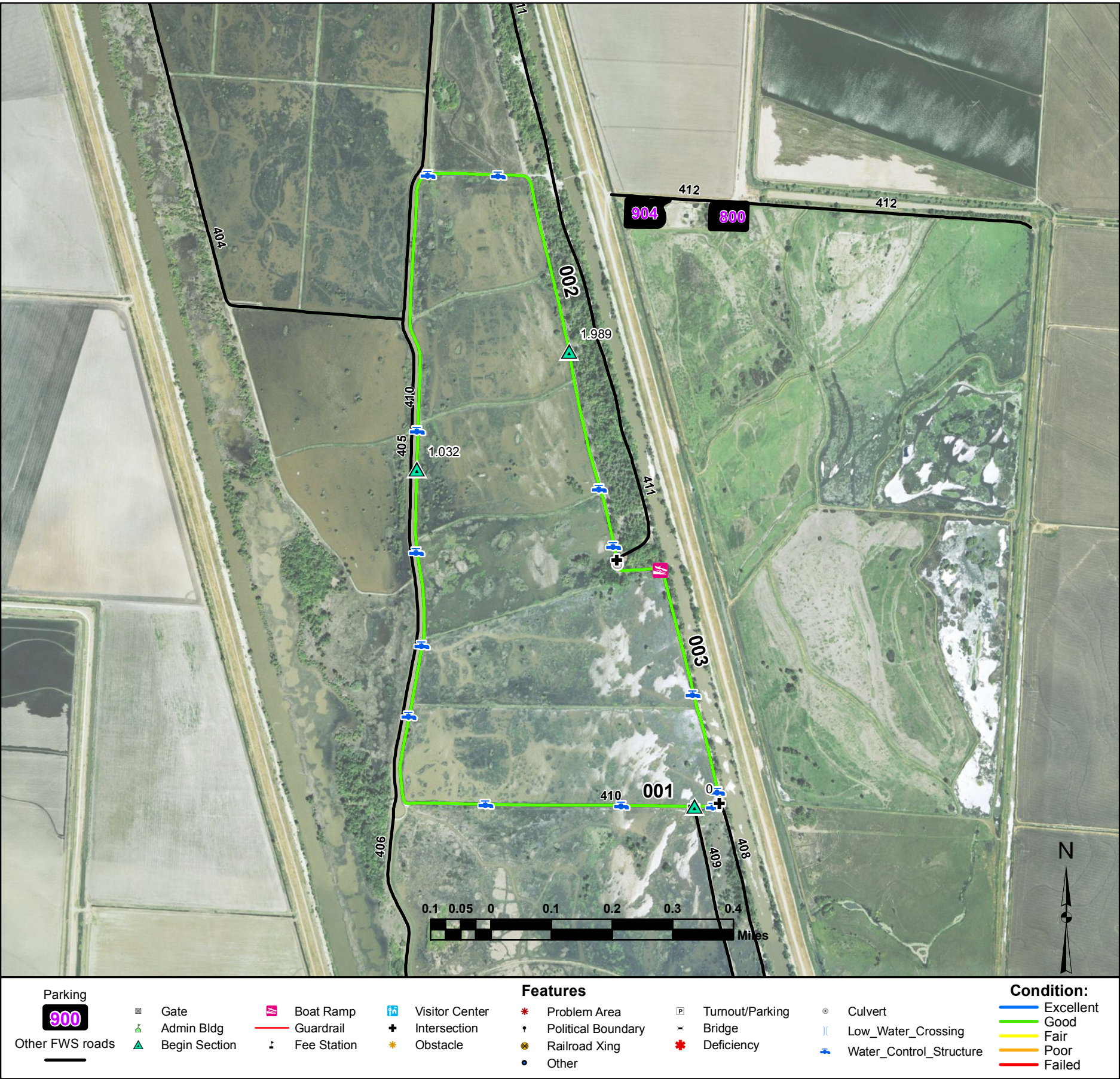
Features	Mile Post	Features	Mile Post	Features	Mile Post	Features	Mile Post
Begin Section	001-0.0						
Water Control Structure	001-0.02						
Intersection	001-0.03						
Water Control Structure	001-0.8						
Water Control Structure	001-0.9						
Begin Section	002-0.96						
Intersection	002-1.25						
Water Control Structure	002-1.42						
Water Control Structure	002-1.48						
Water Control Structure	002-1.86						
Begin Section	003-1.96						
Intersection	003-2.2						
Gate	003-2.21						













Middle Tree Road

From Tract 12/14 Perimeter Access Road (Route 410) to Hughes Road

Route Number: 411

Total Route Mileage: 1.47

Asset Number	10000523	10000523			
Section Number	001	002			
Section Length (miles)	0.96	0.51			
Inspection Date	02-29-2012	02-29-2012			
Surface Type	Native	Native			
Number of Lanes	1	1			
Roadway Width (feet)	12	12			
Condition	Good	Fair			
Remaining Service Life (years)	5	4			
Estimated Cost to Repair	\$2,000	\$1,300			
Current Replacement Value	\$415,300	\$220,600			

Features	Mile Post	Features	Mile Post	Features	Mile Post	Features	Mile Post
Begin Section	001-0.0						
Culvert	001-0.11						
Water Control Structure	001-0.7						
Begin Section	002-0.96						
Culvert	002-1.24						
Gate	002-1.46						



North Boundary of 440 Road

From Corp of Engineers levee to refuge boundary

Route Number: 412

Total Route Mileage: 0.69

Asset Number	10000561	10000561			
Section Number	001	002			
Section Length (miles)	0.22	0.47			
Inspection Date	02-29-2012	02-29-2012			
Surface Type	Gravel	Gravel			
Number of Lanes	2	1			
Roadway Width (feet)	18	12			
Condition	Excellent	Good			
Remaining Service Life (years)	10	7			
Estimated Cost to Repair	\$0	\$900			
Current Replacement Value	\$184,000	\$393,000			

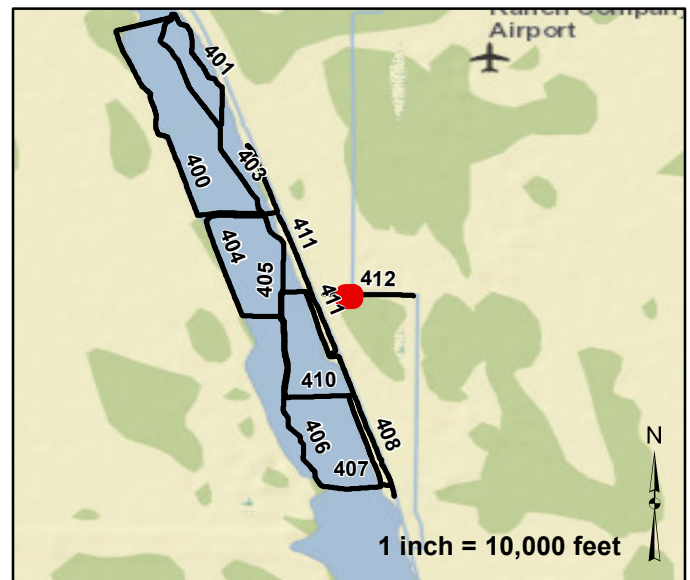
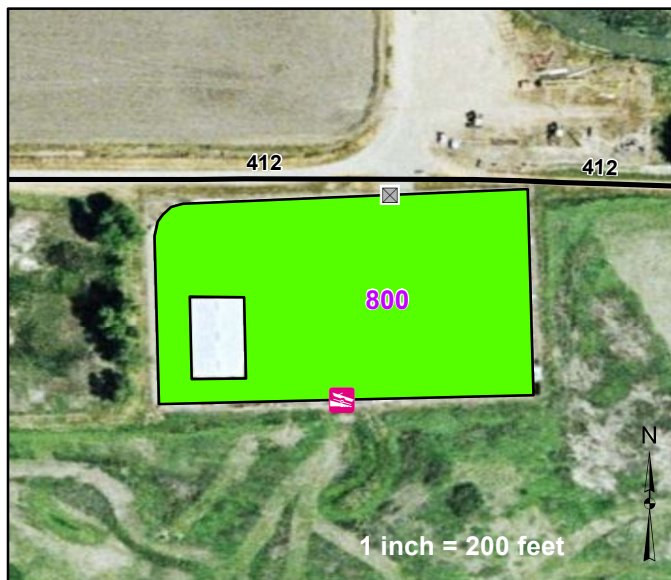
Features	Mile Post	Features	Mile Post	Features	Mile Post	Features	Mile Post
Begin Section	001-0.0						
Culvert	001-0.0						
Gate	001-0.0						
Turnout/Parking	001-0.09						
Gate	001-0.19						
Turnout/Parking	001-0.2						
Begin Section	002-0.22						
Gate	002-0.22						
Water Control Structure	002-0.31						
Water Control Structure	002-0.49						
Water Control Structure	002-0.59						

Route Number:800

Maintenance Yard Parking

From North Boundary of 440 Road (Route 412) at Schlag Road intersection

Asset Number	Area (Sq Ft)	Condition	Surface Type	Cost to Improve	Inspection Date	Current Replacement Value
10000527	60070	Good	Gravel	\$10,900	02-29-2012	\$360,600



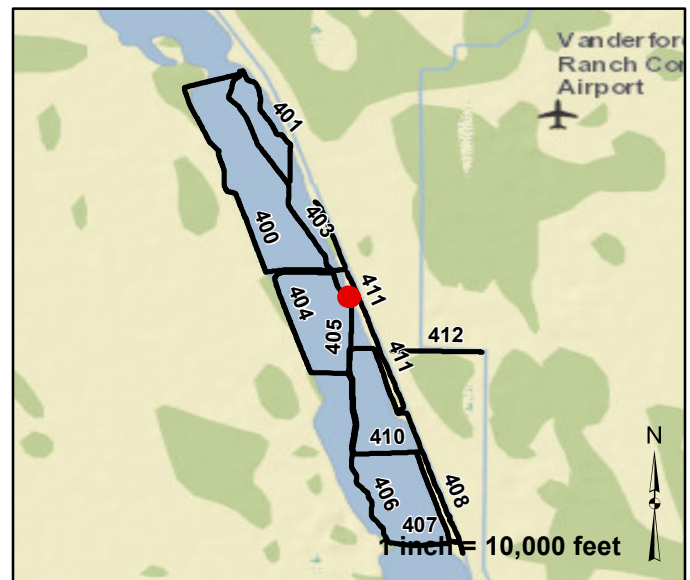
Parking		Features		Condition:	
	Gate		Boat Ramp		Excellent
	Admin Bldg		Guardrail		Good
	Begin Section		Fee Station		Fair
					Poor
					Failed
			Visitor Center		Culvert
			Other		Low_Water_Crossing
			Problem Area		Water_Control_Structure

Route Number:900

North Disabled Hunter Parking

From South Main Canal West Bank Road (Route 405)

Asset Number	Area (Sq Ft)	Condition	Surface Type	Cost to Improve	Inspection Date	Current Replacement Value
10059351	3530	Good	Gravel	\$600	02-29-2012	\$21,200



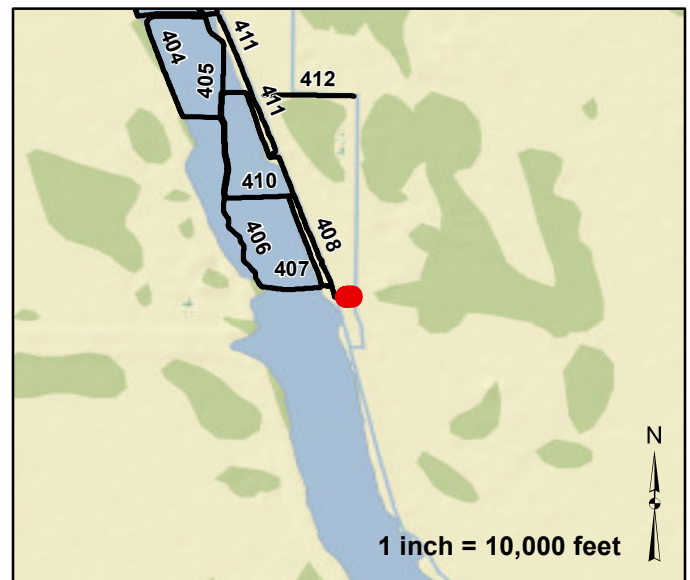
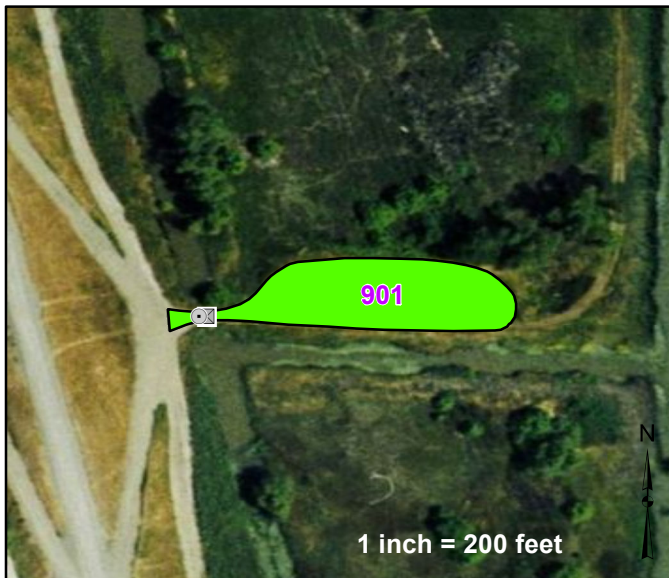
Parking		Features		Condition:	
	Gate		Boat Ramp		Excellent
	Admin Bldg		Guardrail		Good
	Begin Section		Fee Station		Fair
	Other FWS roads		Visitor Center		Poor
			Problem Area		Failed
			Other		
			Water Control Structure		
			Culvert		
			Low Water Crossing		

Route Number:901

Lot B Parking

From east side of the Butte Slough 500 ft east of South Tree Road (Route 408)

Asset Number	Area (Sq Ft)	Condition	Surface Type	Cost to Improve	Inspection Date	Current Replacement Value
10000563	14836	Good	Gravel	\$2,700	02-29-2012	\$89,100



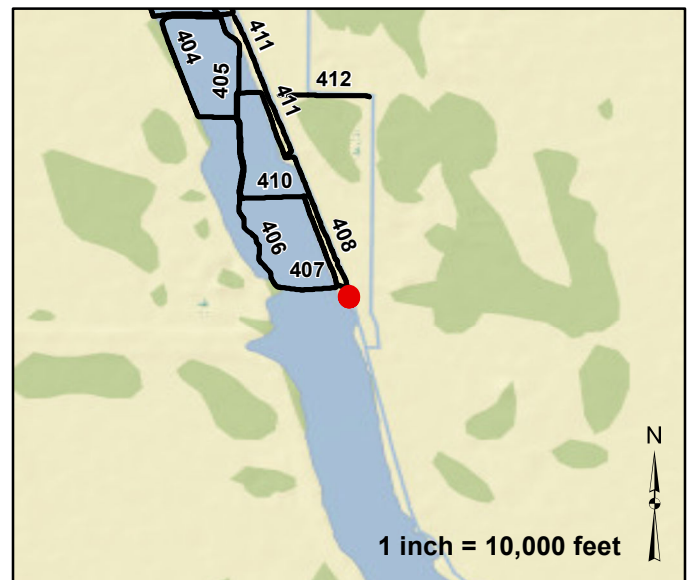
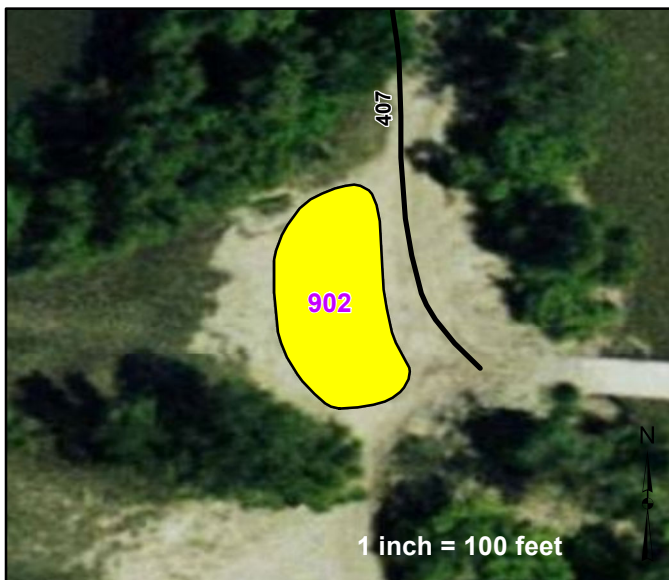
Parking		Features				Condition:	
	Gate		Boat Ramp		Visitor Center		Culvert
	Admin Bldg		Guardrail		Other		Low_Water_Crossing
	Begin Section		Fee Station		Problem Area		Water_Control_Structure
							Excellent
							Good
							Fair
							Poor
							Failed

Route Number:902

South Disabled Hunter Parking

From Tract 17 South Boundary Road (Route 407)

Asset Number	Area (Sq Ft)	Condition	Surface Type	Cost to Improve	Inspection Date	Current Replacement Value
-	4593	Fair	Native	\$1,500	02-29-2012	\$11,900



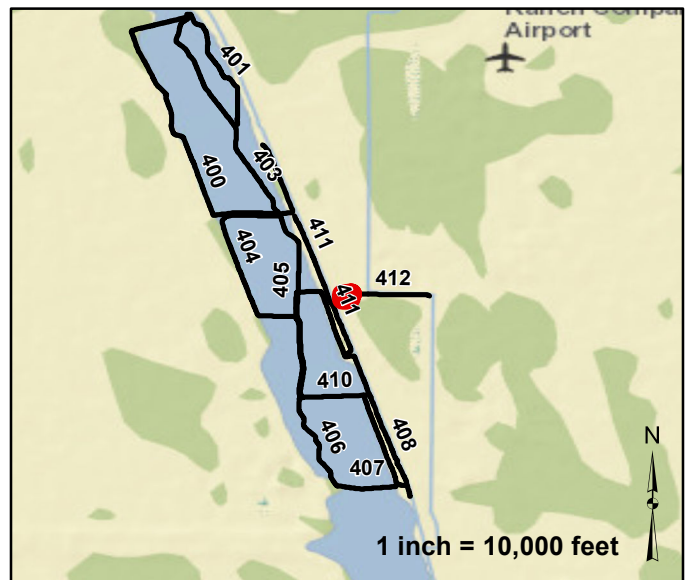
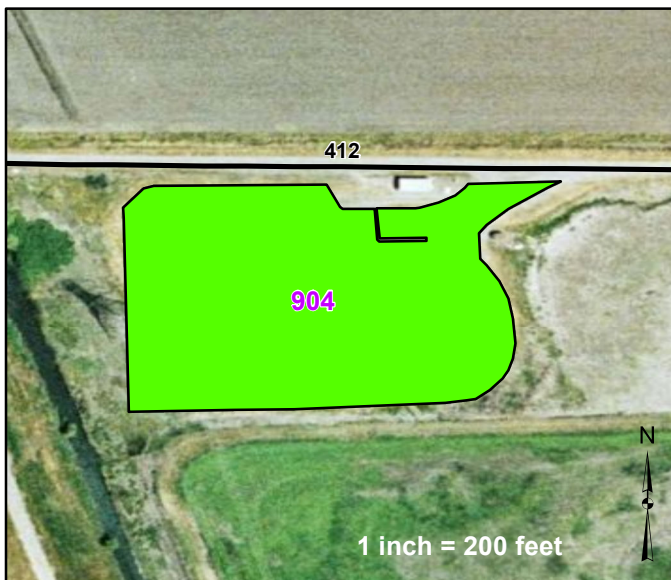
Parking		Features		Condition:	
	Gate		Boat Ramp		Excellent
	Admin Bldg		Guardrail		Good
	Begin Section		Fee Station		Fair
	Other FWS roads		Visitor Center		Poor
			Problem Area		Failed
			Other		
			Culvert		
			Low_Water_Crossing		
			Water_Control_Structure		

Route Number:904

Check Station Parking

From North Boundary of 440 Road (Route 412)

Asset Number	Area (Sq Ft)	Condition	Surface Type	Cost to Improve	Inspection Date	Current Replacement Value
10000562	67937	Good	Gravel	\$12,400	02-29-2012	\$407,800



Parking		Features				Condition:	
	Gate		Boat Ramp		Visitor Center		Excellent
	Admin Bldg		Guardrail		Other		Good
	Begin Section		Fee Station		Problem Area		Fair
					Culvert		Poor
					Low_Water_Crossing		Failed
					Water_Control_Structure		

Sutter Bridge Inventory					
Rte #	Milepost	NBIS #	Sufficiency Rating	Functionally Obsolete	Structurally Deficient
No Bridges to Report					

ROUTE: 400

Features Photographs



Photo: SUTT_C4_1280 Route: 400-001-0.0
Begin Section



Photo: SUTT_C4_1281 Route: 400-001-0.11
Plastic WCS Flashboard Riser 30ft long 24in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1282 Route: 400-001-0.11
Plastic WCS Flashboard Riser 30ft long 24in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1283 Route: 400-001-0.47
Plastic WCS Flashboard Riser 25ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1284 Route: 400-001-0.47
Plastic WCS Flashboard Riser 25ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1285 Route: 400-001-0.56
Metal Cable Gate
Asset# 10059352

ROUTE: 400

Features Photographs



Photo: SUTT_C4_1286 Route: 400-001-0.76
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1287 Route: 400-001-0.76
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1288 Route: 400-002-0.96
Begin Section



Photo: SUTT_C4_1289 Route: 400-002-1.08
Plastic WCS Flashboard Riser 30ft long 24in dia. 4ft deep
Asset# NA



Photo: SUTT_C4_1290 Route: 400-002-1.08
Plastic WCS Flashboard Riser 30ft long 24in dia. 4ft deep
Asset# NA



Photo: SUTT_C4_1291 Route: 400-002-1.81
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA 8-002

ROUTE: 400

Features Photographs



Photo: SUTT_C4_1292 Route: 400-002-1.81
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1293 Route: 400-003-1.97
Begin Section



Photo: SUTT_C4_1294 Route: 400-003-1.98
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1295 Route: 400-003-1.98
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1296 Route: 400-003-2.21
Plastic WCS Flashboard Riser 35ft long 24in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1297 Route: 400-003-2.21
Plastic WCS Flashboard Riser 35ft long 24in dia. 3ft deep
Asset# NA 8-003

ROUTE: 401

Features Photographs



Photo: SUTT_C4_1298 Route: 401-001-0.0
Begin Section



Photo: SUTT_C4_1299 Route: 401-001-0.01
Plastic WCS Flashboard Riser 50ft long 48in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1300 Route: 401-001-0.01
Plastic WCS Flashboard Riser 50ft long 48in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1301 Route: 401-001-0.93
Metal WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1302 Route: 401-001-0.93
Metal WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1303 Route: 401-002-0.95
Begin Section

ROUTE: 401

Features Photographs



Photo: SUTT_C4_1304 Route: 401-002-1.24
Plastic Culvert 30ft long 60in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1305 Route: 401-002-1.24
Plastic Culvert 30ft long 60in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1306 Route: 401-002-1.26
Plastic WCS Flashboard Riser 60ft long 60in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1307 Route: 401-002-1.26
Plastic WCS Flashboard Riser 60ft long 60in dia. 3ft deep
Asset# NA

ROUTE: 402

Features Photographs



Photo: SUTT_C4_1308 Route: 402-001-0.0
Begin Section



Photo: SUTT_C4_1309 Route: 402-001-0.0
Metal Cable Gate
Asset# 10059352



Photo: SUTT_C4_1310 Route: 402-001-0.28
Plastic WCS Flashboard Riser 20ft long 24in dia. 1ft deep
Asset# NA



Photo: SUTT_C4_1311 Route: 402-001-0.28
Plastic WCS Flashboard Riser 20ft long 24in dia. 1ft deep
Asset# NA



Photo: SUTT_C4_1312 Route: 402-001-0.5
Plastic Culvert 20ft long 24in dia. 5ft deep
Asset# NA



Photo: SUTT_C4_1313 Route: 402-001-0.5
Plastic Culvert 20ft long 24in dia. 5ft deep
Asset# NA

ROUTE: 402

Features Photographs



Photo: SUTT_C4_1314 Route: 402-001-0.67
Plastic WCS Flashboard Riser 30ft long 24in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1315 Route: 402-001-0.67
Plastic WCS Flashboard Riser 30ft long 24in dia. 3ft deep
Asset# NA

ROUTE: 403

Features Photographs



Photo: SUTT_C4_1316 Route: 403-001-0.0
Begin Section



Photo: SUTT_C4_1317 Route: 403-001-0.02
Metal WCS Other 100ft long 36in dia. 1ft deep
Pump Asset# NA



Photo: SUTT_C4_1318 Route: 403-001-0.02
Metal WCS Other 100ft long 36in dia. 1ft deep
Pump Asset# NA



Photo: SUTT_C4_1319 Route: 403-001-0.8
Plastic WCS Flashboard Riser 20ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1320 Route: 403-001-0.8
Plastic WCS Flashboard Riser 20ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1321 Route: 403-001-0.9
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA 8-008

ROUTE: 403

Features Photographs



Photo: SUTT_C4_1322 Route: 403-001-0.9
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1323 Route: 403-002-0.96
Begin Section



Photo: SUTT_C4_1324 Route: 403-002-1.42
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1325 Route: 403-002-1.42
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1326 Route: 403-002-1.48
Plastic WCS Flashboard Riser 25ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1327 Route: 403-002-1.48
Plastic WCS Flashboard Riser 25ft long 24in dia. 2ft deep
Asset# NA 8-009

ROUTE: 403

Features Photographs



Photo: SUTT_C4_1328 Route: 403-002-1.86
Plastic WCS Flashboard Riser 20ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1329 Route: 403-002-1.86
Plastic WCS Flashboard Riser 20ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1330 Route: 403-003-1.96
Begin Section

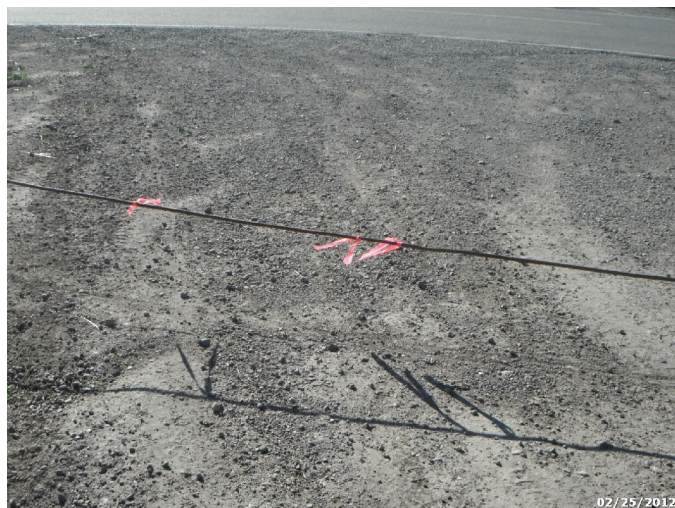


Photo: SUTT_C4_1331 Route: 403-003-2.21
Metal Cable Gate
Asset# 10059352

ROUTE: 404

Features Photographs



Photo: SUTT_C4_1730 Route: 404-001-0.0
Begin Section



Photo: SUTT_C4_1731 Route: 404-001-0.47
Metal Cable Gate
Asset# 10059352



Photo: SUTT_C4_1733 Route: 404-001-0.48
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1734 Route: 404-001-0.48
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1735 Route: 404-001-0.66
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1736 Route: 404-001-0.66
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA
8-011

ROUTE: 404

Features Photographs



Photo: SUTT_C4_1737 Route: 404-001-0.7
Plastic WCS Flashboard Riser 30ft long 24in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1738 Route: 404-001-0.7
Plastic WCS Flashboard Riser 30ft long 24in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1739 Route: 404-002-0.96
Begin Section



Photo: SUTT_C4_1740 Route: 404-002-0.99
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1741 Route: 404-002-0.99
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1742 Route: 404-002-1.18
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA
8-012

ROUTE: 404

Features Photographs



Photo: SUTT_C4_1743 Route: 404-002-1.18
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1744 Route: 404-002-1.39
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1745 Route: 404-002-1.39
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1746 Route: 404-002-1.4
Plastic WCS Flashboard Riser 30ft long 36in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1747 Route: 404-002-1.4
Plastic WCS Flashboard Riser 30ft long 36in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1748 Route: 404-002-1.46
Plastic WCS Flashboard Riser 30ft long 24in dia. 3ft deep
Asset# NA

ROUTE: 404

Features Photographs



Photo: SUTT_C4_1749 Route: 404-002-1.46
Plastic WCS Flashboard Riser 30ft long 24in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1750 Route: 404-002-1.64
Plastic WCS Flashboard Riser 30ft long 24in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1751 Route: 404-002-1.64
Plastic WCS Flashboard Riser 30ft long 24in dia. 3ft deep
Asset# NA

ROUTE: 405

Features Photographs



Photo: SUTT_C4_1754 Route: 405-001-0.0
Begin Section



Photo: SUTT_C4_1755 Route: 405-001-0.0
Metal Cable Gate
Asset# 10059352



Photo: SUTT_C4_1756 Route: 405-001-0.14
Plastic WCS Flashboard Riser 35ft long 48in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1757 Route: 405-001-0.14
Plastic WCS Flashboard Riser 35ft long 48in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1758 Route: 405-001-0.33
Plastic WCS Flashboard Riser 30ft long 48in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1759 Route: 405-001-0.33
Plastic WCS Flashboard Riser 30ft long 48in dia. 2ft deep
Asset# NA
8-015

ROUTE: 405

Features Photographs



Photo: SUTT_C4_1760 Route: 405-001-0.79
Plastic WCS Flashboard Riser 30ft long 48in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1761 Route: 405-001-0.79
Plastic WCS Flashboard Riser 30ft long 48in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1762 Route: 405-002-0.96
Begin Section



Photo: SUTT_C4_1763 Route: 405-002-1.07
Plastic WCS Flashboard Riser 40ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1764 Route: 405-002-1.07
Plastic WCS Flashboard Riser 40ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1765 Route: 405-002-1.25
Plastic WCS Flashboard Riser 30ft long 24in dia. 3ft deep
Asset# NA
8-016

ROUTE: 405

Features Photographs



Photo: SUTT_C4_1766 Route: 405-002-1.25
Plastic WCS Flashboard Riser 30ft long 24in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1767 Route: 405-002-1.84
Plastic WCS Flashboard Riser 30ft long 24in dia. 5ft deep
Asset# NA



Photo: SUTT_C4_1768 Route: 405-002-1.84
Plastic WCS Flashboard Riser 30ft long 24in dia. 5ft deep
Asset# NA

ROUTE: 406

Features Photographs



Photo: SUTT_C4_1769 Route: 406-001-0.0
Begin Section



Photo: SUTT_C4_1770 Route: 406-001-0.62
Plastic WCS Flashboard Riser 20ft long 30in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1771 Route: 406-001-0.62
Plastic WCS Flashboard Riser 20ft long 30in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1772 Route: 406-001-0.82
Plastic WCS Flashboard Riser 35ft long 30in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1773 Route: 406-001-0.82
Plastic WCS Flashboard Riser 35ft long 30in dia. 2ft deep
Asset# NA

ROUTE: 407

Features Photographs



Photo: SUTT_C4_1774 Route: 407-001-0.0
Begin Section



Photo: SUTT_C4_1775 Route: 407-001-0.28
Plastic WCS Flashboard Riser 30ft long 24in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1776 Route: 407-001-0.28
Plastic WCS Flashboard Riser 30ft long 24in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1777 Route: 407-001-0.48
Plastic WCS Flashboard Riser 30ft long 30in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1778 Route: 407-001-0.48
Plastic WCS Flashboard Riser 30ft long 30in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1779 Route: 407-001-0.63
Metal Culvert 25ft long 36in dia. 3ft deep
Asset# NA

ROUTE: 407

Features Photographs



Photo: SUTT_C4_1780 Route: 407-001-0.63
Metal Culvert 25ft long 36in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1781 Route: 407-001-0.64
Metal Cable Gate
Asset# 10059352

ROUTE: 408

Features Photographs



Photo: SUTT_C4_1789 Route: 408-001-0.0
Begin Section



Photo: SUTT_C4_1790 Route: 408-001-0.06
Plastic WCS Flashboard Riser 35ft long 24in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1791 Route: 408-001-0.06
Plastic WCS Flashboard Riser 35ft long 24in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1793 Route: 408-001-0.09
Plastic Culvert 30ft long 24in dia. 1ft deep
Asset# NA



Photo: SUTT_C4_1794 Route: 408-001-0.09
Plastic Culvert 30ft long 24in dia. 1ft deep
Asset# NA



Photo: SUTT_C4_1795 Route: 408-001-0.23
Plastic WCS Flashboard Riser 40ft long 24in dia. 4ft deep
Asset# NA
8-021

ROUTE: 408

Features Photographs



Photo: SUTT_C4_1796 Route: 408-001-0.23
Plastic WCS Flashboard Riser 40ft long 24in dia. 4ft deep
Asset# NA



Photo: SUTT_C4_1797 Route: 408-001-0.39
Problem Area Tree down over route



Photo: SUTT_C4_1805 Route: 408-001-0.74
Plastic WCS Flashboard Riser 30ft long 24in dia. 4ft deep
Asset# NA



Photo: SUTT_C4_1806 Route: 408-001-0.74
Plastic WCS Flashboard Riser 30ft long 24in dia. 4ft deep
Asset# NA

ROUTE: 409

Features Photographs



Photo: SUTT_C4_1798 Route: 409-001-0.0
Begin Section



Photo: SUTT_C4_1799 Route: 409-001-0.27
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1800 Route: 409-001-0.27
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1801 Route: 409-001-0.6
Plastic WCS Flashboard Riser 30ft long 30in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1802 Route: 409-001-0.6
Plastic WCS Flashboard Riser 30ft long 30in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1803 Route: 409-001-0.88
Plastic WCS Flashboard Riser 25ft long 30in dia. 4ft deep
Asset# NA 8-023

ROUTE: 409

Features Photographs



Photo: SUTT_C4_1804 Route: 409-001-0.88
Plastic WCS Flashboard Riser 25ft long 30in dia. 4ft deep
Asset# NA

ROUTE: 410

Features Photographs



Photo: SUTT_C4_1807 Route: 410-001-0.0
Begin Section



Photo: SUTT_C4_1808 Route: 410-001-0.14
Plastic WCS Flashboard Riser 30ft long 24in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1809 Route: 410-001-0.14
Plastic WCS Flashboard Riser 30ft long 24in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1810 Route: 410-001-0.39
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1811 Route: 410-001-0.39
Plastic WCS Flashboard Riser 30ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1812 Route: 410-001-0.67
Plastic WCS Flashboard Riser 30ft long 30in dia. 3ft deep
Asset# NA 8-025

ROUTE: 410

Features Photographs



Photo: SUTT_C4_1813 Route: 410-001-0.67
Plastic WCS Flashboard Riser 30ft long 30in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1814 Route: 410-001-0.77
Plastic WCS Flashboard Riser 30ft long 30in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1815 Route: 410-001-0.77
Plastic WCS Flashboard Riser 30ft long 30in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1816 Route: 410-001-0.91
Plastic WCS Flashboard Riser 30ft long 30in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1817 Route: 410-001-0.91
Plastic WCS Flashboard Riser 30ft long 30in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1820 Route: 410-002-1.03
Begin Section

ROUTE: 410

Features Photographs



Photo: SUTT_C4_1818 Route: 410-002-1.09
Plastic WCS Flashboard Riser 25ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1819 Route: 410-002-1.09
Plastic WCS Flashboard Riser 25ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1821 Route: 410-002-1.51
Plastic WCS Flashboard Riser 50ft long 30in dia. 1ft deep
Asset# NA



Photo: SUTT_C4_1822 Route: 410-002-1.51
Plastic WCS Flashboard Riser 50ft long 30in dia. 1ft deep
Asset# NA



Photo: SUTT_C4_1823 Route: 410-002-1.65
Plastic WCS Flashboard Riser 25ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1824 Route: 410-002-1.65
Plastic WCS Flashboard Riser 25ft long 24in dia. 2ft deep
Asset# NA

ROUTE: 410

Features Photographs



Photo: SUTT_C4_1825 Route: 410-003-1.99
Begin Section



Photo: SUTT_C4_1826 Route: 410-003-2.21
Plastic WCS Flashboard Riser 30ft long 30in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1827 Route: 410-003-2.21
Plastic WCS Flashboard Riser 30ft long 30in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1828 Route: 410-003-2.31
Plastic WCS Flashboard Riser 30ft long 30in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1829 Route: 410-003-2.31
Plastic WCS Flashboard Riser 30ft long 30in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1830 Route: 410-003-2.34
Plastic Culvert 25ft long 30in dia. 2ft deep
Asset# NA

ROUTE: 410

Features Photographs



Photo: SUTT_C4_1831 Route: 410-003-2.34
Plastic Culvert 25ft long 30in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1832 Route: 410-003-2.64
Plastic WCS Flashboard Riser 60ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1833 Route: 410-003-2.64
Plastic WCS Flashboard Riser 60ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1834 Route: 410-003-2.8
Plastic WCS Flashboard Riser 60ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1835 Route: 410-003-2.8
Plastic WCS Flashboard Riser 60ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1836 Route: 410-003-2.83
Plastic WCS Flashboard Riser 30ft long 24in dia. 4ft deep
Asset# NA
8-029

ROUTE: 410

Features Photographs



Photo: SUTT_C4_1837 Route: 410-003-2.83
Plastic WCS Flashboard Riser 30ft long 24in dia. 4ft deep
Asset# NA

ROUTE: 411

Features Photographs



Photo: SUTT_C4_1838 Route: 411-001-0.0
Begin Section



Photo: SUTT_C4_1839 Route: 411-001-0.11
Plastic Culvert 50ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1840 Route: 411-001-0.11
Plastic Culvert 50ft long 24in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1841 Route: 411-001-0.7
Plastic WCS Flashboard Riser 30ft long 24in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1842 Route: 411-001-0.7
Plastic WCS Flashboard Riser 30ft long 24in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1843 Route: 411-002-0.96
Begin Section

ROUTE: 411

Features Photographs



Photo: SUTT_C4_1844 Route: 411-002-1.24
Metal Culvert 20ft long 18in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1845 Route: 411-002-1.24
Metal Culvert 20ft long 18in dia. 3ft deep
Asset# NA



Photo: SUTT_C4_1846 Route: 411-002-1.46
Metal Cable Gate
Asset# 10059352

ROUTE: 412

Features Photographs



Photo: SUTT_C4_1851 Route: 412-001-0.0
Metal Culvert 25ft long 48in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1852 Route: 412-001-0.0
Metal Culvert 25ft long 48in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1850 Route: 412-001-0.0
Begin Section



Photo: SUTT_C4_1853 Route: 412-001-0.0
Metal Open Rail Gate
Asset# 10059352



Photo: SUTT_C4_1854 Route: 412-001-0.19
Metal Cable Gate
Asset# 10059352



Photo: SUTT_C4_1855 Route: 412-002-0.22
Begin Section

ROUTE: 412

Features Photographs



Photo: SUTT_C4_1856 Route: 412-002-0.22
Metal Cable Gate
Asset# 10059352



Photo: SUTT_C4_1857 Route: 412-002-0.31
Plastic WCS Flashboard Riser 30ft long 24in dia. 1ft deep
Asset# NA



Photo: SUTT_C4_1858 Route: 412-002-0.31
Plastic WCS Flashboard Riser 30ft long 24in dia. 1ft deep
Asset# NA



Photo: SUTT_C4_1859 Route: 412-002-0.49
Plastic WCS Flashboard Riser 30ft long 24in dia. 1ft deep
Asset# NA



Photo: SUTT_C4_1860 Route: 412-002-0.49
Plastic WCS Flashboard Riser 30ft long 24in dia. 1ft deep
Asset# NA



Photo: SUTT_C4_1861 Route: 412-002-0.59
Plastic WCS Flashboard Riser 30ft long 24in dia. 1ft deep
No Inlet photo available
Asset# NA 8-034

ROUTE: 800

Features Photographs



Photo: SUTT_C4_1864 Route: 800
Metal Chain Link Gate
Asset# 10000537



Photo: SUTT_C4_1865 Route: 800
Metal Chain Link Gate
Asset# 10000537

ROUTE: 901

Features Photographs



Photo: SUTT_C4_1785 Route: 901
Metal Culvert 40ft long 36in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1786 Route: 901
Metal Culvert 40ft long 36in dia. 2ft deep
Asset# NA



Photo: SUTT_C4_1784 Route: 901
Metal Open Rail Gate
Asset# 10059352

Accident Summary

Number of Accidents Reported	Timespan of Accidents	Injuries	Fatalities
0	No Accidents to Report	0	0

APPENDIX

TABLE 1 - GENERAL FWS ROAD FUNCTIONAL CLASSIFICATION	
Class I	Principal Refuge Road (Public Roads) - Routes that constitute the main access route, main auto tour route, or thoroughfare for refuge visitors. These routes are accessible by 2WD vehicles. Routes are numbered from 10 to 99.
Class II	Connector Refuge Road (Public Roads) - Routes that provide circulation within the refuge. These routes can also provide access to areas of scenic, scientific, recreational or cultural interest, such as overlooks, campgrounds, education centers, etc. These routes are accessible by 2WD vehicles. Routes are numbered from 100 to 199.
Class III	Special Purpose Refuge Road (Public Roads) - Roads that provide circulation within special use areas such as campgrounds or public concessionaire facilities or access to remote areas of the refuge. These routes may not be 2WD accessible. Routes are numbered from 200 to 299
Class IV	Administrative Access Road (Administrative Roads) - Routes intended for access to administrative developments or structures such as maintenance offices, employee quarters, or utility areas. These routes are accessible by 2WD vehicles. These routes may restrict access to the general public. Routes are numbered from 300 to 399.
Class V	Restricted Road (Administrative Roads) - Routes normally closed to the public, such as maintenance roads, service roads, patrol roads, and fire breaks. These routes may be open to the public for a short period of time for a special use, such as hunting access. These routes may not be 2WD accessible. Routes are numbered from 400 to 499.

A refuge road system contains those routes within or giving access to a refuge or other unit of the FWS that are administered by the FWS, or by the Service in cooperation with other agencies. The assignment of a functional classification (FC) to a refuge road is not based on traffic volumes or design speed, but on the intended use or function of that route

DESCRIPTION OF RATING SYSTEM

Rating Data is collected on four different surface types: Asphalt, Concrete, Gravel, and Native. The Utah LTAP Center's Remaining Service Life (RSL) system is used for all surface types. The RSL system is based on the Strategic Highway Research Program's (SHRP) Distress Identification Manual.

Asphalt Rating System

Data is collected on the following distresses and conditions:

- **Fatigue Cracking** - Interconnected cracks forming small irregular shapes.
- **Longitudinal Cracking** - Cracks running parallel with the roadway, in the direction of traffic.
- **Transverse Cracking** - Cracks perpendicular to the roadway, going across the lane or lanes.
- **Block Cracking** - Interconnected cracks forming large blocks.
- **Edge Cracking** - Cracks running along the edge of the pavement surface.
- **Patches** - Original surface repaired with new asphalt patch material.
- **Potholes** - Holes or depressions in the pavement.
- **Rutting** - surface depressions in the wheel paths.
- **Roughness** - Evenness of pavement for serviceability.
- **Drainage** - Ability of the road surface to drain water based on proper slope.

A Condition Rating value is calculated for each homogenous pavement section, and can be up to 1 mile in length.

Rating Index Formula

Fatigue, longitudinal, transverse, block, and edge cracking, along with patching and potholes are rated on a 0 - 9 scale (0 = no distress, 9 = maximum distress). The rating given is based on the extent and the severity of the distress. Rutting, roughness, and drainage are rated on a 0 - 3 scale (0 = excellent, 3 = poor). Each distress type has given Remaining Service Life (RSL) values (in years) based on the rating for that particular distress. The distress with the rating resulting in the lowest RSL value is considered to be the governing distress. That value is then assigned as the RSL of the road segment.

Concrete Rating System

Data is collected on the following distresses and conditions:

- **Spalling of Joints** - Chipping, breaking, or cracking of slab edges
- **Joint Seal Damage** - Any damage or condition that enables materials or water to infiltrate into the joint from the surface.
- **Corner Breaks** - A portion of the slab separated by a crack that intersects the adjacent transverse and longitudinal joints, forming approximately a 45° angle to the direction.
- **Broken Slabs** - Faulting and/or cracking localized to individual slabs.

- **Faulting** – Difference in elevation across a crack or joint.
- **Longitudinal Cracking** – Cracks in the pavement running parallel to road.
- **Transverse Cracking** - Cracks in the pavement running perpendicular to the direction of traffic.
- **Patch Deterioration** – Faulting, settling, or cracking of previously placed patch
- **Map Cracking** – A series of cracks that extend only into the upper surface of the Slab

A Condition Rating value is calculated for each homogenous pavement section, and can be up to 1 mile in length.

Rating Index Formula

The rating procedure for concrete pavement is the same as that for asphalt pavement described previously. Each of the distresses described above are rated on the same 0 – 9 scale. The governing distress is then determined and the RSL associated with that distress is assigned to the road segment.

Gravel and Native Rating System

Data is collected on the following distresses and conditions:

- **Cross Section (Crown)** - Roadway built so that the center is higher than the shoulder, to prevent water from pooling on roadway.
- **Roadside Drainage** - Roadside ditches and culverts to handle water flow and prevent pooling on the roadside.
- **Corrugations (Washboarding)** - Small trenches or holes developing perpendicular to the roadway.
- **Potholes** - Holes or depressions in the roadway.
- **Rutting** - Depressions running parallel with the roadway, in the wheelpaths.
- **Dust** - Amount of dust caused by traffic.
- **Loose Aggregate (Gravel Only)** - Loose gravel, typically piled up on the roadway edges or centerline.

A Condition Rating value is calculated for each homogenous pavement section, and can be up to 1 mile in length.

Rating Index Formula

The rating procedure for unpaved roads is the same as that for asphalt and concrete pavements described previously. Of the distresses described above, corrugations, potholes, rutting, and loose aggregate are rated on the same 0 – 9 scale previously mentioned. Cross section, roadside drainage, and dust are rated on the same 0 – 3 scale described for asphalt pavement. The governing distress is then determined and the RSL associated with that distress is assigned to the road segment.

Condition Descriptions by Surface Type

The following definitions are used to describe pavement condition for the various surface types. These are general guidelines for condition indications.

Asphalt

Excellent – Recently constructed or overlaid road where construction or overlay was performed correctly- No maintenance required. RSL = 19-20 years.

Good – Low extent longitudinal and transverse cracks. All cracks are 1/4" or less with little or no crack erosion. Patches are in good condition and applied correctly. Routine Maintenance recommended. RSL = 13-18 years.

Fair - Roads are in good structural condition with little or no fatigue cracking. Longitudinal, transverse, and edge cracking is at medium extent and severity. Block cracking is not extensive. Any patches are in good condition. Preventative maintenance recommended. RSL = 7-12 years.

Poor - Road beginning to show signs of structural distress. Fatigue cracking is medium to high extent and medium severity. Cracking will be severe. Surface may have severe block cracking and show. Patches are in fair to poor condition. There is moderate distortion or rutting and occasional potholes. Rehabilitation recommended. RSL = 1-6 years.

Failed - Road is severely deteriorated. Signs of structural failure appear along with severe and extensive fatigue cracking, distortion, potholes, or extensive patches in poor condition. Reconstruction recommended. RSL = 0 years.

Concrete

Excellent - New pavement. No maintenance required. RSL = 19-20 years

Good - First signs of transverse cracking, patch or repair, more extensive pop-outs, or scaling. Sealing or routine maintenance recommended. RSL = 13-18 years.

Fair – Pavement has joint or crack spalling, and/or faulting, along with cracking at corners with broken pieces. Any Patches are in fair condition and faulting is at a minimum. Preventative maintenance recommended. RSL = 7-12 years.

Poor - Joints and cracks are open 1 inch, spalled, or patched. Faulting is more severe. Rehabilitation recommended. RSL = 1-6 years.

Failed - Most slabs have failed structurally, and faulting is severe. Reconstruction recommended. RSL = 0 years.11-9

The following table shows the relationship between RSL and condition.

SUBJECTIVE CONDITION RATING FOR REMAINING SERVICE LIFE (Asphalt and Concrete Pavements)								
	FAILED	POOR		FAIR		GOOD		EXCELLENT
RSL Years	0	1-3	4-6	7-9	10-12	13-15	16-18	19-20

Gravel and Native

Note - Native surfaces do not have a gravel layer.

Excellent - Newly constructed road that has been constructed properly with proper crown, drainage and gravel layer. Little or no distress. No maintenance recommended. RSL = 8-10 years.

Good - Crown, drainage provisions, and gravel layer are in good condition. Distress limited to traffic effects such as dust, loose aggregate, and low severity corrugations (wash boarding). RSL = 5-7 years.

Fair - Adequate drainage and crown through majority of roadway. Crown repair, ditch improvement may be necessary. Road has more severe corrugations and potholes. Preventative maintenance recommended. RSL = 3-4 years.

Poor - Travel at slow speeds is necessary. Additional gravel layer needed to carry traffic. Poor crown. Ditching is inadequate and rutting is extensive and severe. Rehabilitation recommended. RSL = 1-2 years.

Failed - Travel is difficult, and road may be closed at times. Rutting and Corrugations are very severe. Total Reconstruction of road is recommended. RSL = 0 years.

The following table shows the RSL values for gravel and native roads in terms of excellent, good, fair, poor, and failed condition.

SUBJECTIVE CONDITION RATING FOR REMAINING SERVICE LIFE (Gravel and Native Surfaces)					
	FAILED	POOR	FAIR	GOOD	EXCELLENT
RSL Years	0	1-2	3-4	5-7	8-10

NATIVE PRIMITIVE/IMPROVED RATING SHEET

<u>Cross Section (Crown)*</u>			
Severity	Condition		Description
	No Defects	0	Crown 4-6" with no restriction of water flow from centerline to ditch.
	Minor Defects	1	Inadequate or inconsistent crown. Drainage to ditch may be restricted.
	Moderate Defects	2	Flat crown, drainage to ditch restricted.
	Major Defects	3	Reverse crown, bowl-shaped road, drainage on roadway

<u>Rutting</u>				
Severity	Extent (Length)			
	No Defects	Low <10%	Med 10-30%	High >30%
	Low < 6"	1	2	3
	Med 6-12"	4	5	6
	High > 12"	7	8	9

<u>Roadside Drainage*</u>			
Severity	Condition		Description
	No Defects	0	Wide, deep ditches (>4') with no restriction to water flow.
	Minor Defects	1	Adequate ditches (>2' deep), minor obstructions restrict water flow.
	Moderate Defects	2	Shallow, narrow and obstructed ditches. Minor erosion of road.
	Major Defects	3	No ditch, drainage on roadway with moderate to severe erosion.

<u>Potholes</u>				
Severity	Extent (Area)			
	No Defects	Low <10%	Med 10-30%	High >30%
	Low < 6"	1	2	3
	Med 6-12"	4	5	6
	High > 12"	7	8	9

<u>Dust</u>			
Severity	Condition		Description
	No Defects	0	No obstruction to sight distance.
	Minor Defects	1	Sight distance > 550'
	Moderate Defects	2	Sight distance 225'-550'
	Major Defects	3	Sight distance < 225'

<u>Corrugations</u>				
Severity	Extent (Length)			
	No Defects	Low <10%	Med 10-30%	High >30%
	Low < 3"	1	2	3
	Med 3-6"	4	5	6
	High > 6"	7	8	9

* Crown and Drainage are not rated for roads that have no constructed crown or drainage. This applies to Native and Gravel roads.

GRAVEL RATING SHEET

Cross Section (Crown)

Severity	Condition		Description
	No Defects	0	Crown 4-6" with no restriction of water flow from centerline to ditch.
	Minor Defects	1	Inadequate or inconsistent crown. Drainage to ditch may be restricted.
	Moderate Defects	2	Flat crown, drainage to ditch restricted.
	Major Defects	3	Reverse crown, bowl-shaped road, drainage on roadway

Rutting

Severity	Extent (Length)			
	No Defects	Low <10%	Med 10-30%	High >30%
	Low < 1"	1	2	3
	Med 1-3"	4	5	6
	High > 3"	7	8	9

Roadside Drainage

Severity	Condition		Description
	No Defects	0	Wide, deep ditches (>4') with no restriction to water flow.
	Minor Defects	1	Adequate ditches (>2' deep), minor obstructions restrict water flow.
	Moderate Defects	2	Shallow, narrow and obstructed ditches. Minor erosion of road.
	Major Defects	3	No ditch, drainage on roadway with moderate to severe erosion.

Potholes

Severity	Extent (Area)			
	No Defects	Low <10%	Med 10-30%	High >30%
	Low < 1"	1	2	3
	Med 1-3"	4	5	6
	High > 3"	7	8	9

Dust

Severity	Condition		Description
	No Defects	0	No obstruction to sight distance.
	Minor Defects	1	Sight distance > 550'
	Moderate Defects	2	Sight distance 225'-550'
	Major Defects	3	Sight distance < 225'

Corrugations

Severity	Extent (Length)			
	No Defects	Low <10%	Med 10-30%	High >30%
	Low < 2"	1	2	3
	Med 2-4"	4	5	6
	High > 4"	7	8	9

* Crown and Drainage are not rated for roads that have no constructed crown or drainage. This applies to Native and Gravel roads.

Loose Aggregate

Severity	Extent (Area)			
	No Defects	Low <10%	Med 10-30%	High >30%
	Low < 1"	1	2	3
	Med 1-3"	4	5	6
	High > 3"	7	8	9

ASPHALT RATING SHEET

Fatigue Cracking

Severity	Extent			
	No Defects	Low 1 crack WP	Med 2 cracks WP	High >30% length
	Low-Cracks < 1/4"	1	2	3
	Med-Cracks 1/4-3/4"	4	5	6
	High-Cracks > 3/4"	7	8	9

Edge Cracking

Severity	Extent (Length)			
	No Defects	Low <10%	Med 10-30%	High >30%
	0-6" from curb	1	2	3
	6-18" from curb	4	5	6
	> 18" from curb	7	8	9

Longitudinal Cracking

Severity	Extent			
	No Defects	Low 1 crack full length	Med 2 cracks full length	High >2 cracks full length
	Low-Cracks < 1/4"	1	2	3
	Med-Cracks 1/4-3/4"	4	5	6
	High-Cracks > 3/4"	7	8	9

Block Cracking

Severity	Extent (Length)			
	No Defects	Low > 15x15' squares	Med 15-10' squares	High <10x10' squares
	Low-Cracks < 1/4"	1	2	3
	Med-Cracks 1/4-3/4"	4	5	6
	High-Cracks > 3/4"	7	8	9

Transverse Cracking

Severity	Extent (ft between cracks)			
	No Defects	Low > 200'	Med 200-50'	High < 50'
	Low-Cracks < 1/4"	1	2	3
	Med-Cracks 1/4-3/4"	4	5	6
	High-Cracks > 3/4"	7	8	9

Utility Cuts

Severity	Extent (Length)			
	No Defects	Low <10%	Med 10-30%	High >30%
	Low-Cracks < 1/4"	1	2	3
	Med-Cracks 1/4-3/4"	4	5	6
	High-Cracks > 3/4"	7	8	9

Drainage/Roughness/Rutting

Severity	Condition		Description
	No Defects	0	Wide, deep ditches with no obstructions, smooth ride, no rutting, no potholes.
	Minor Defects	1	Drainage may be obstructed, < 1" rutting, minor roughness.
	Moderate Defects	2	Poor drainage, 1-2" rutting, noticeable roughness, potholes < 6" wide.
	Major Defects	3	No drainage; > 2" rutting; potholes 6-12" wide create roughness requiring reduced speeds.

CONCRETE RATING SHEET

Spalling of Joints

		Extent (% joints)		
Severity	No Defects	Low <10%	Med 10-20%	High >20%
	Low Spalls < 3"	1	2	3
	Med Spalls 3-6"	4	5	6
	High Spalls > 6"	7	8	9

Broken Slabs

		Extent (% slabs)		
Severity	No Defects	Low <5%	Med 5-15%	High >15%
	Low-no more than 3 pieces, no spalling/faulting	1	2	3
	Med-broken into >3 pieces, spalling/faulting <1/4"	4	5	6
	High-4 or more pieces, spalling/faulting >1/4"	7	8	9

Transverse Cracks

		Extent (% slabs)		
Severity	No Defects	Low <10%	Med 10-20%	High >20%
	Low-Cracks < 1/8"; no spalling/faulting	1	2	3
	Med-Cracks 1/8-1/2"; spall <3", fault >1/4"	4	5	6
	High-Cracks > 1/2"; spall >3", fault >1/4"	7	8	9

Joint Seal Damage

		Extent (%joints)		
Severity	No Defects	Low <10%	Med 10-20%	High >20%
	Low <10% joint length	1	2	3
	Med 10-50% joint length	4	5	6
	High >50% joint length	7	8	9

Faulting

		Extent (Length)		
Severity	No Defects	Low <10%	Med 10-30%	High >30%
	Low < 1/2"	1	2	3
	Med 1/2-1"	4	5	6
	High > 1"	7	8	9

Patch Deterioration

		Extent (Area)		
Severity	No Defects	Low <10%	Med 10-30%	High >30%
	Low-no fault, no settle at perimeter	1	2	3
	Med-fault & settle <1/4" at perimeter	4	5	6
	High-fault & settle >1/4" at perimeter, cracked patch	7	8	9

Corner Breaks

		Extent (% of slabs)		
Severity	No Defects	Low <10%	Med 10-20%	High >20%
	Low-corner cracks, no spalling or faulting	1	2	3
	Med-crack slightly spalled & faulted <1/4"	4	5	6
	High-crack highly spalled & faulted >1/4"	7	8	9

Longitudinal Cracks

		Extent (% slabs)		
Severity	No Defects	Low <10%	Med 10-20%	High >20%
	Low-Cracks < 1/8"; no spalling/faulting	1	2	3
	Med-Cracks 1/8-1/2"; spall <3", fault >1/2"	4	5	6
	High-Cracks > 1/2"; spall >3", fault >1/2"	7	8	9

Map Cracks

		Extent (Area)		
Severity	No Defects	Low <10%	Med 10-20%	High >20%
	Low-small connected cracks, no spalling	1	2	3
	Med-connected cracks, no spalling	4	5	6
	High-large connected cracks with surface spalling	7	8	9

Deficiency Ratings With Associated Remaining Service Life

Asphalt Rating Sheet

Fatigue Cracking		Edge Cracking		Transverse Cracking		Utility Cuts	
Distress Rating	Remaining Service Life	Distress Rating	Remaining Service Life	Distress Rating	Remaining Service Life	Distress Rating	Remaining Service Life
0	20	0	20	0	20	0	20
1	10	1	12	1	14	1	14
2	8	2	10	2	12	2	12
3	6	3	8	3	10	3	10
4	8	4	10	4	12	4	12
5	6	5	8	5	10	5	10
6	4	6	6	6	8	6	8
7	6	7	8	7	10	7	10
8	2	8	6	8	6	8	6
9	0	9	4	9	2	9	2

Longitudinal Cracking		Block Cracking		Drainage/Roughness/Rutting	
Distress Rating	Remaining Service Life	Distress Rating	Remaining Service Life	Distress Rating	Remaining Service Life
0	20	0	20	0	20
1	14	1	12	1	16
2	12	2	10	2	10
3	10	3	8	3	4
4	12	4	10		
5	10	5	8		
6	8	6	6		
7	10	7	12		
8	8	8	6		
9	6	9	2		

Concrete Rating Sheet

Spalling		Broken Slabs		Transverse Cracks	
Distress Rating	Remaining Service Life	Distress Rating	Remaining Service Life	Distress Rating	Remaining Service Life
0	20	0	20	0	20
1	15	1	15	1	18
2	12	2	12	2	15
3	10	3	10	3	12
4	12	4	12	4	15
5	10	5	10	5	10
6	8	6	8	6	6
7	10	7	10	7	10
8	6	8	6	8	4
9	0	9	0	9	0

Joint Seal Damage		Faulting		Patch Deterioration	
Distress Rating	Remaining Service Life	Distress Rating	Remaining Service Life	Distress Rating	Remaining Service Life
0	20	0	20	0	18
1	16	1	15	1	16
2	14	2	12	2	14
3	12	3	10	3	12
4	14	4	12	4	12
5	10	5	8	5	10
6	8	6	6	6	8
7	12	7	10	7	10
8	8	8	4	8	6
9	6	9	0	9	0

Corner Breaks		Longitudinal Cracks		Map Cracks	
Distress Rating	Remaining Service Life	Distress Rating	Remaining Service Life	Distress Rating	Remaining Service Life
0	18	0	20	0	20
1	16	1	18	1	18
2	14	2	15	2	15
3	12	3	12	3	12
4	12	4	15	4	12
5	10	5	10	5	10
6	8	6	6	6	6
7	10	7	10	7	10
8	6	8	4	8	4
9	0	9	0	9	0

SUBJECTIVE CONDITION RATING FOR REMAINING SERVICE LIFE IN YEARS (Asphalt & Concrete Roads)

RSL	FAILED 0	POOR 1 - 6	FAIR 7 - 12	GOOD 13 - 18	EXCELLENT 19 - 20
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Deficiency Ratings With Associated Remaining Service Life

Native Primitive Improved Rating Sheet

Cross Section		Rutting		Roadside Drainage	
Distress Rating	Remaining Service Life	Distress Rating	Remaining Service Life	Distress Rating	Remaining Service Life
0	10	0	10	0	10
1	7	1	9	1	8
2	5	2	7	2	4
3	0	3	5	3	0
		4	7		
		5	4		
		6	3		
		7	4		
		8	2		
		9	0		

Potholes		Dust		Corrugations	
Distress Rating	Remaining Service Life	Distress Rating	Remaining Service Life	Distress Rating	Remaining Service Life
0	10	0	10	0	10
1	9	1	8	1	9
2	7	2	6	2	7
3	5	3	2	3	7
4	7			4	6
5	4			5	5
6	3			6	5
7	4			7	4
8	2			8	3
9	0			9	0

Gravel Rating Sheet

Cross Section		Rutting		Roadside Drainage	
Distress Rating	Remaining Service Life	Distress Rating	Remaining Service Life	Distress Rating	Remaining Service Life
0	10	0	10	0	10
1	7	1	9	1	8
2	5	2	7	2	4
3	0	3	5	3	0
		4	7		
		5	4		
		6	3		
		7	4		
		8	2		
		9	0		

Potholes		Dust		Corrugations	
Distress Rating	Remaining Service Life	Distress Rating	Remaining Service Life	Distress Rating	Remaining Service Life
0	10	0	10	0	10
1	9	1	8	1	9
2	7	2	6	2	7
3	5	3	2	3	7
4	7			4	6
5	4			5	5
6	3			6	5
7	4			7	4
8	2			8	3
9	0			9	0

Loose Aggregate	
Distress Rating	Remaining Service Life
0	10
1	9
2	8
3	7
4	8
5	7
6	6
7	5
8	3
9	0

SUBJECTIVE CONDITION RATING FOR REMAINING SERVICE LIFE IN YEARS (Gravel & Native Roads)

RSL	FAILED	POOR	FAIR	GOOD	EXCELLENT
	0	1 - 2	3 - 4	5 - 7	8 - 10